

## 16.0 INTRODUCTION TO DIGITAL IMAGING TECHNOLOGY

**Prerequisite:** None

This course is offered to students who wish to pursue careers in the field of photography and computer graphics. Studies will include the design and manipulation of images to develop communications media and productions. Still and motion images will be developed, printed, copied, edited and/or projected in a studio environment or presentation format. Emphasis will be placed on industrial applications of digital imagery.

PROGRAM TASK LISTING EFFECTIVE DATE: November 2002

PROGRAM AREA: Technology Education

PROGRAM TITLE: Digital Imaging Technology

IDAHO CODE NUMBER: TE 1953

- 16.01 Demonstrate the ability to work safely with a variety of technologies.
- 16.02 Demonstrate interpersonal skills as they relate to the workplace.
- 16.03 Identify and apply methods of information acquisition and utilization.
- 16.04 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
- 16.05 Demonstrate and apply design/problem-solving processes.
- 16.06 Express an understanding of technological systems and their complex interrelationships.
- 16.07 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
- 16.08 Discuss individual interests and aptitudes as they relate to a career.
- 16.09 Demonstrate employability skills and habits.
- 16.10 Demonstrate an understanding of entrepreneurship.
- 16.11 Make an informed and meaningful career choice.

- 16.12 Demonstrate proper and safe procedures and technical knowledge and skills in the use and care of drafting instruments, materials and equipment.
- 16.13 Using proper digital camera techniques, capture images on storage devices.
- 16.14 Retrieve and save digital photographed images from/to storage devices.
- 16.15 Modify and store digital photographed images.
- 16.16 Print a digital photograph.
- 16.17 Identify to processes of Pixography.
- 16.18 Using a computer and graphics software modify or enhance a digital photograph.
- 16.19 Using various image acquisitions acquire digital images.
- 16.20 Demonstrate a knowledge and application of the advanced editing features of graphic software.

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16.01 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--

The student will be able to:

1. Select appropriate tools, procedures, and/or equipment needed to produce a product.
2. Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
3. Demonstrate knowledge required to maintain and troubleshoot.
4. Follow laboratory safety rules and procedures.
5. Demonstrate good housekeeping at work state and within total laboratory.
6. Identify color-coding safety standards.

7. Explain fire prevention and safety precautions and practices for extinguishing fires.
8. Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

16.02 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--

The student will be able to:

1. Perform roles in a student personnel system or in the Idaho Technology Student Association (ID-TSA).
2. Participate as a member of a team.
3. Teach others new skills.
4. Identify skills needed to serve clients/customers.
5. Demonstrate leadership skills.
6. Describe strategies necessary for negotiating agreements.
7. Demonstrate the application of skills necessary to work with people of diverse backgrounds.
8. Form an understanding and appreciation for work after listening to or observing technology workers.
9. Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
10. Form an understanding and appreciation for the roles and work of co-workers.

16.03 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--

The student will be able to:

1. Define terms related to computers.
2. Identify and describe methods of information acquisition and evaluation.
3. Discuss advantages and disadvantages in the application of technologies.
4. Produce a plan to organize and maintain information relevant to emerging technologies.
5. Comprehend and communicate information relevant to emerging technologies.
6. Demonstrate the use of computers to process information.

16.04 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

1. Identify and explain the main and subordinate ideas in a written work.
2. Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
3. Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
4. Distinguish fact from opinion.
5. Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
6. Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
7. Improve one's own writing by restructuring, correcting errors, and rewriting.
8. Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
9. Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
10. Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
11. Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
12. Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
13. Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
14. Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.
15. Make estimates and approximations, and judge the reasonableness of a result.
16. Use elementary concepts of probability and statistics.
17. Draw, read, and analyze graphs, charts, and tables.
18. Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and fieldwork.
19. Organize and communicate the results obtained by observation and experimentation.
20. Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion;

temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

21. Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

16.05 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

1. Describe and explain steps in the design/problem-solving process.
2. Propose solutions to given problems.
3. Design and implement the optimal solution to a given problem.
4. Document each step of the design/problem-solving process.
5. Demonstrate "brainstorming" as a process to solve problems.
6. Define "critical thinking" and its value in the problem-solving process.

16.06 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--

The student will be able to:

1. Demonstrate knowledge of how social, organizational, and technological systems work.
2. Explore methods used to monitor and correct performance of technological systems.
3. Design and implement an optimal solution to a given problem.
4. Outline major historical technological developments or events.
5. Identify recent advances in technology.
6. Explain problem-solving roles of technology.
7. Forecast a technological development or event.
8. Define technology.

16.07 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--

The student will be able to:

1. Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
2. Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
3. Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
4. Display knowledge of the efficient use of human resources.

16.08 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--

The student will be able to:

1. Describe individual strengths and weaknesses.
2. Discuss individual interests related to a career.
3. Identify careers within specific areas of technology.
4. Explore careers within specific areas of interest.

16.09 DEMONSTRATE EMPLOYABILITY SKILLS AND HABITS--

The student will be able to:

1. Identify employment opportunities.
2. Apply employment seeking skills.
3. Interpret employment capabilities.
4. Demonstrate appropriate work behavior.
5. Maintain safe and healthy environment.
6. Maintain businesslike image.
7. Maintain working relationships with others.
8. Communicate on the job.
9. Adapt to change.
10. Demonstrate a knowledge of manufacturing.
11. Perform mathematical calculations.
12. Compile a portfolio.

16.10 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--

The student will be able to:

1. Define entrepreneurship.
2. Describe the importance of entrepreneurship to the American economy.
3. List the advantages and disadvantages of business ownership.
4. Identify the risks involved in ownership of a business.
5. Identify the necessary personal characteristics of a successful entrepreneur.
6. Identify the business skills needed to operate a small business efficiently and effectively.

16.11 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--

The student will be able to:

1. Make a tentative occupational choice based on the information learned and interest developed in this course.
2. Review tentative occupational choices based on the information learned and interest developed in this course.

16.12 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT DIGITAL IMAGING TECHNOLOGY

The student will be able to:

1. Define Digital Imaging technology.
2. Outline major technological developments and events in the history of Digital Imaging technology.
3. Identify recent advances in Digital Imaging technology.
4. Forecast a development or event in Digital Imaging technology.

16.13 USING PROPER DIGITAL CAMERA TECHNIQUES, CAPTURE IMAGES ON STORAGE DEVICES –

The student will be able to:

1. List basic digital camera components.
2. Explain the function of each basic component.
3. Demonstrate proper disk/CD/memory stick care and handling.
4. Demonstrate proper camera care and handling.
5. Describe various digital photographic related equipment.
6. Use proper exposure settings to capture a digital image on disk, CD, or memory stick.

16.14 RETRIEVE AND SAVE DIGITAL PHOTOGRAPHED IMAGES FROM/TO STORAGE DEVICES –

The student will be able to:

1. Apply safety handling and storage techniques.
2. Identify basic storage retrieval equipment.
3. Boot-up and use computer software to retrieve stored images.
4. Evaluate quality of retrieved images.
5. Save digital images on various storage devices.
6. Demonstrate the correct procedure for shutting down a computer system.

16.15 MODIFY AND STORE DIGITAL PHOTOGRAPHED IMAGES –

The student will be able to:

1. Identify basic digital photo editing equipment and software.
2. Properly set up digital photo editing equipment and load editing software.
3. Demonstrate basic editing skills and techniques.
4. Save edited/modified digital photo images onto selected storage devices.

16.16 PRINT A DIGITAL PHOTOGRAPH –

The student will be able to:

1. Identify digital photograph printing equipment.
2. Explain the processes of printing equipment.
3. Demonstrate proper safety and use of printing equipment.
4. Correctly produce a printed digital image.
5. Properly close and shut down editing software, computer, and printing equipment.

**16.17 IDENTIFY TO PROCESSES OF PIXOGRAPHY –**

The student will be able to:

1. Explain the function and operation of LCD display panel/screen.
2. Explain the principle of binary digits.
3. Explain the terms bits, bytes, kilobyte, megabyte (MB), and gigabyte.
4. Use graphic software to enlarge digital photographs to pixel magnification.
5. Identify the three colors in a screen triad dot.
6. Explain the acronym RGB.
7. Explain the differences in color bit quality. (8-16-24-36, etc.)
8. Describe CMYK separations.
9. Explain the term pixel resolution.
10. Explain the general classes of file types.
11. Explain the basic processing speeds of PC computers.
12. List the differences between RAM, ROM, and VRAM memory.
13. Identify the connection between the graphic card and monitor selection.
14. Identify various storage devices.

**16.18 USING A COMPUTER AND GRAPHICS SOFTWARE MODIFY OR ENHANCE A DIGITAL PHOTOGRAPH –**

The student will be able to:

1. Identify components of a computer system capable of modifying a digital photograph.
2. Demonstrate proper safety and use of a digital editing computer system.
3. Demonstrate editing techniques using paint/graphic or digital editing software.
4. Enhance a digital photograph.

**16.19 USING VARIOUS IMAGE ACQUISITIONS ACQUIRE DIGITAL IMAGES –**

The student will be able to:

1. List the various methods used for obtaining digital images.
2. Take digital photographs and download them to a computer.

3. Evaluate the advantages and disadvantages of single shot digital cameras, motion video, and digital video cameras.
4. Identify the basic types of scanners and their use.
5. Explain the differences between a one pass and three pass scanner.
6. Demonstrate the proper use of scanning devices, (i.e. hand held, flatbed, snapshot), and function of various digital acquisition pieces of equipment. (i.e. QuickCam ball, digital camera, scanners).

16.20 DEMONSTRATE A KNOWLEDGE AND APPLICATION OF THE ADVANCED EDITING FEATURES OF GRAPHIC SOFTWARE –

The student will be able to:

1. Properly crop a digital photograph.
2. Rotate a digital photograph.
3. Change the brightness and contrast of a digital photograph.
4. Change a digital photograph to black and white (grayscale).
5. Resize a digital photograph.
6. Fill a selected shape with a color or texture.
7. Copy and paste part of a digital image.
8. Use a selection tool to select various colors on a digital photograph.
9. Erase a selected area on a digital photograph.
10. Spray and draw freehand lines on a digital photograph.
11. Magnify a digital photograph to modify single pixels on a digital photograph.
12. Add text to a digital photograph.
13. Combine parts of different digital photographs to make a new image.
14. Use special effect tools to modify or enhance a digital photograph. (ie., sharpen, blur, emboss, twirl, shadow, soften, smudge, texture, filters, etc.)
15. Identify the terms associated with graphic/paint program tools and features.